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Evolution and Personality: What Should a Comprehensive Theory Address and How?

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Abstract

Personality is arguably the most integrative area of psychology; yet, it is an area about which evolutionary psychologists have had comparatively little to say. This is unfortunate because evolutionary theory holds great potential as a framework that can link together the disparate aspects that make up a person. We suggest that progress in evolutionary personality psychology will be helped by clarification of precisely what an evolutionary theory of personality would need to address. To this end, we first describe and assess some extant contributions by theorists attempting to understand personality from an evolutionary perspective. Next, we endorse a working definition of what personality entails and outline three types of personality differences – character traits, goals/motives, and selves/identities – that any comprehensive evolutionary theory of personality should address. Finally, we suggest an approach forward, one where evolved species-typical motives orient people toward adaptive ends and result in the differentiation of individuals' unique selves.

Theorizing about the ultimate origins of human behavioral patterns has steadily increased in popularity since the publication of E. O. Wilson's pioneering 1975 book, *Sociobiology: The New Synthesis*. Evolutionary explanations for such topics as decision-making, attraction, group-functioning, person perception, and even religion are now debated in the pages of top psychology journals as well as in specialty evolutionary psychology journals. However, the field of personality has yet to attract much attention from evolutionists. A few scholars have speculated about the evolution of personality, typically with a focus on individual differences on the Big Five personality traits (e.g., Buss, 1991; Nettle, 2006); nevertheless, a comprehensive and convincing evolutionary perspective on personality and individual differences has yet to emerge. Indeed, some have even wondered whether it makes sense to apply an evolutionary perspective to the study of personality differences, arguing that adaptationist explanations are only appropriate for universal (species typical) features because individual differences in personality are merely 'noise' (Tooby & Cosmides, 1990; discussed below). In contrast, others have suggested that evolution must be the ‘glue’ that holds together any truly comprehensive personality theory, including theories of abnormality and uniqueness (Millon, 1990; Siegert & Ward, 2007).

One reason for the lack of progress in this area may be the confusion over what issues a comprehensive evolutionary personality psychology would need to address. An oft-cited formulation by Kluckhohn and Murray (1953; see also Revelle, 1995) helps illustrate the multiple possible foci of personality theory. Kluckhohn and Murray argued that a complete theory of personality should be able to address the facts that every human being is (a) like all other human beings, (b) like some other human beings, and (c) like no other human being. Indeed, personality psychologists typically ask all three types of question. For example: Why do people in general experience ‘positive illusions?’ Why are some types of people especially susceptible to positive illusions? Why does young Martin, in particular, think he will become an internet billionaire, despite an apparent allergy to work?

Admittedly, Kluckhohn and Murray’s (1953) definition takes a very broad view of what personality is; regardless, we believe that all three aspects must be addressed in a complete theory of personality. But to date, evolutionary scholars have devoted the overwhelming majority of their attention to attempting to understand universal human nature, Kluckhohn and Murray’s first aspect of personality. Evolutionary explanations for how and why people differ, such that they are unlike some other people or unlike all other people (Kluckhohn and Murray’s second and third issues), have not been as forthcoming. Our belief is that establishing greater agreement about the proper purview of evolutionary personality psychology, including both universals and individual differences, will boost progress in this important area. Accordingly, this essay will first review some of the notable extant contributions on the topic of evolved personality, then point out shortcomings to these approaches, and finally suggest some ways forward.

Are Individual Differences Mere ‘Noise?’

Tooby and Cosmides (1990), influential theorists in the field of evolutionary psychology, notably dismissed individual differences as a suitable subject for their adaptationist paradigm. Natural selection, they argued, produces a ‘winnowing effect’ whereby suboptimal traits are selected against, eventually arriving at species-wide convergence around phenotypic optima. We will consider their provocative views in greater detail, below.

Working from the uncontroversial premise that humans are biological organisms, evolutionary psychological theory (see Tooby & Cosmides, 2005) assumes that the most fruitful approach for studying humans’ psychological nature is to think of behaviors as features shaped by natural selection, or *adaptations*. An ‘adaptation,’ in this context, is a behavior that exists in present form because ancestors who displayed that behavior were more reproductively successful than individuals who did not. According to Tooby and Cosmides (1990), 'every personality phenomenon is, from an evolutionary perspective, analyzable as either (a) an adaptation, (b) an incidental by-product of an adaptation, (c) the product of noise in the system, or (d) some combination of these' (p. 19). Furthermore, they argued that individual differences in personality traits (in, for example, extraversion) by their nature can almost never constitute adaptations. Psychological adaptations are usually complex, and complex adaptations tend not to be encoded for by a single gene, but rather require the coordination of a number of different genes in order to work properly. Because sexual reproduction leads to a reshuffling of the genetic deck (so to speak) within each new generation, it is consequently unlikely that rival complex adaptations could coexist in different members of the same population for long. Crossbreeding between individuals possessing rival complex adaptations would tend to result in offspring whose genes failed to successfully specify either adaptation. Consequently, it would be highly unlikely that personality differences (e.g., different levels of extraversion) could themselves constitute adaptations.

Then where do personality trait differences come from? One common argument in evolutionary psychology is that most individual differences result from different experiences during development. Natural selection designed humans to be somewhat 'plastic' or malleable by developmental experiences. This 'phenotypic plasticity' is adaptive because it enables peoples' dispositional tendencies to be somewhat fine-tuned in a way that better equips them to meet the challenges of their particular environments. In support of this explanation, Tooby and Cosmides (1990) pointed out that many prominent theories of personality have sought to explain individual differences as the result of interactions between a universal personality system and each individual's own history of personal experiences. For example, Freud saw differences among adults in such traits as neuroticism as resulting from the failure to progress beyond a given developmental stage (e.g., anal), and he saw developmental progression as affected by environmental factors (e.g., a mother who was overly critical during toilet training). One need not agree with Freud or any other personality theorist in order to appreciate that the same innate, universal personality system could result in different outputs (varying trait expressions) when it has been exposed to different inputs (experiences during development). Although Tooby and Cosmides did not detail their view of precisely what humans' universal personality system might look like (see below for our thoughts on this question), they did suggest that it would be expected to be sensitive to environmental information and that its interaction with people's different formative experiences can explain many of the substantive personality differences existing between individuals. So theoretically, even if every baby began with an identical set of personality traits (a universal personality, so to speak), we should observe variable adult personalities because personality is designed to be shaped by development, and each person encounters a unique developmental environment.

But of course, we do not all begin with identical traits, or with identical temperaments (an important precursor of later traits). Indeed, behavioral genetic research demonstrates a high rate of heritability for many personality traits (Tellegen et al., 1988), strongly suggesting that environmental influences cannot account for all personality differences. Does this mean that evolutionary concepts (i.e., natural selection and adaptation) must be recruited to address Kluckhohn and Murray's second issue, of why every person is similar to some people but different from others (e.g., of why all extraverts are highly social, different from non-extraverts)? Not necessarily. Evolutionary psychologists (see Tooby & Cosmides, 1990) have focused on two main non-adaptationist routes by which heritable individual differences can occur. The first has to do with sexual reproduction, an adaptation which may have evolved because it offered enhanced protection against harmful parasites. Unlike asexual reproduction, which results in genetic clones, sexual reproduction ensures that every organism has a unique genotype, and consequently phenotype, which in turn insures that every immune system has a fresh start against pathogens. Although various genotypes may happen to correspond to various associated personality styles, the personality styles themselves would be adaptively irrelevant. In Gould and Lewontin's (1979) terms, personality may be a 'spandrel,' that is, a mere side-effect of the processes (in this case, the immunologic processes) that are really driving the action (see Buss, Haselton, Shackelford, Bleske, & Wakefield, 1998).

The other proposed non-adaptationist cause of heritable individual differences is genetic drift: random genetic mutations whose adaptive significance is neutral (neither beneficial nor detrimental) and which therefore are not selected against and can sometimes tend to accumulate in the population over time. Along with heredity and natural selection, genotypic variation is a necessary component of Darwinian evolution. In biology, variation in the genotype results from random mutations. Genetic mutations frequently have a deleterious effect on the resulting phenotype's fitness and tend consequently to be weeded out by natural selection. Much less commonly, mutations can prove beneficial, which tends to drive their spread through the population over many generations. But other times, a mutation may have no substantive consequences on fitness and, while not selected for, may still by chance end up getting passed on to subsequent generations and even increasing in frequency, not because it is adaptive, but rather because functionally it doesn't matter. Such a process is likely responsible for some individual differences in personality, according to Tooby and Cosmides (1990).

In sum, evolutionary psychologists have generally applied evolutionary theory to only the first of Murray and Kluckhohn's three issues (universal human nature) and have been doubtful that genetically influenced personality traits have been shaped by selective pressures. However, Wilson (1994) took issue with the position that phenotypic plasticity (resulting from a universal human nature) is the only mechanism causing adaptive individual differences in psychological traits. Extending the game theoretic models developed in the 1960s and 1970s (e.g., Lewontin, 1961; Maynard-Smith, 1982), Wilson argued for the existence of genetic polymorphisms that allow for changes over time in what is most adaptive. Wilson (1994) cited his home field of ethology, where mathematical models that assumed selection pressures for a single, unchanging, optimal phenotype had prevented researchers until relatively recent times from appreciating the nature of adaptive genetic polymorphisms. Once researchers started looking in nature for instances where varying selection pressures have produced typologically different phenotypes, they were found to be relatively common among nonhuman animals, and Wilson thought they might be found among humans as well.

One way the optimal phenotype might change is if environmental conditions tend to fluctuate significantly over time or place and these changes affect which phenotype is best equipped to survive/reproduce. Such situations are described as having *fluctuating optima* (Hansen, 2006). For example, during times of prosperity, low neuroticism might be a more adaptive trait profile, whereas during unstable or uncertain times, high neuroticism might be a more adaptive trait profile. Another closely related way the optimal phenotype might change follows from the observation that an organism's environment includes more than simply its physical surroundings – it also includes its fellow animals. That is, the fitness of a given genotype may differ depending on the relative rate of other genotypes in the population. After all, having a body that allows exploitation of a given niche may be great if the niche is relatively unoccupied, but no help if everyone else on the block has the same skills, and is fighting over the same crumbs in the same niche. Such a situation can give rise to *frequency dependent selection*, in which two or more morphs or types of the same species can coexist in relative equilibrium (Schneider, 2006).

For example, male bluegill sunfish come in different morphs or types (Dominey, 1980; Gross, 1982). The larger 'parental' males mature later, copulate openly with females, and defend their nests. Two smaller morphs coexist in the population, maturing earlier and pursuing a lower-cost parasitic strategy. The 'sneaker morph' is quite small and nimble and the 'satellite' morph closely mimics the resemblance of a female bluegill. Both the sneaker and the mimic follow a reproductive strategy of surreptitiously fertilizing females' eggs, whereas the females are busy copulating with parentals. Though the parentals produce more offspring on average, they invest more resources and a longer lifespan in doing so. The parasitic morphs and the larger parental morph can coexist in equilibrium because they employ different strategies, the relative success of which is dependent in part upon the ratio each type of morph in the population. Translating this example into personality traits, whereas a population of highly agreeable people may be unstable because it is susceptible to exploitation by disagreeable people, a population of only disagreeable people might also be unstable because it does not gain the benefits of group functioning; thus, the relative frequency of the two types might find a stable equilibrium.

Wilson (1994) thought that some personality differences might reflect evolved adaptive responses to these types of chronically unstable environmental conditions. Whereas Tooby and Cosmides (1990) acknowledged the theoretical possibility of fluctuating optima and frequency-dependent selection causing alternative adaptive strategies to evolve in humans, they dismissed it as highly unlikely in practice. Buss (1991), too, was doubtful and raised the question: If personality differences truly reflected alternative adaptive strategies then should not personality traits be bi-modally distributed in the population (i.e., many people who are either high or low on a trait, but few people in the middle area in between), just as distinct male morphs exist within the bluegill population? For example, highly extraverted people might fill 'car salesmen' and 'game-show host' niches, and introverted people fill 'researcher' or 'writer' niches. Obviously, however, there is much middle ground between these two extremes. Because trait expressions tend to be distributed continuously and normally (McCrae & Costa, 1990), Buss (1991) argued that the multiple optima and frequency-dependent perspectives are not supported.

However, MacDonald (1995) and Nettle (2006) further developed the multiple-optima or niche-seeking perspective, in the process offering an explanation why human personality traits tend to be normally distributed. MacDonald (1995) employed the five-factor model of personality traits to suggest in detail how the normal range for each trait can represent a range of different, yet on average roughly equally viable, strategies for fitness maximization across different settings. However, McDonald suggested that people who fall toward one of the extreme tails of trait distribution tend to experience problems and psychopathologies whose impairment of fitness probably served to limit the range of trait expression in the gene pool (see Trull & Durrett, 2005, for evidence of the linkage between psychopathology and trait extremes). Nettle (2006), elaborating on MacDonald's (1995) explanation, argued for the importance of fitness trade-offs in attempting to account for widespread heritable individual differences across species. Personality traits such as extraversion have benefits as well as drawbacks, the relative importance of which will be expected to vary as environmental conditions vary. This leads to a situation where no particular trait profile is optimal, and a wide range of adaptive trait configurations might be expected. Thus, from MacDonald and Nettle's perspective, there need not be a maladaptive intermediary region of trait expression between alternate optima – if the environment is sufficiently heterogeneous, a wide range of trait expressions can be equally adaptive, and therefore maintained, as a result of fitness trade-offs.

Penke, Denissen, and Miller (2007) in a recent paper concluded that from the standpoint of contemporary research in genetics, the most plausible sources of heritable differences in personality traits were Wilson's (1994) proposed mechanisms of environmental heterogeneity (i.e., fluctuating optima) and frequency-dependent selection. Penke et al. also cast doubt on the plausibility of the alternate proposals that heritable personality traits are (a) simply by-products of immunologically oriented adaptations or (b) the result of the accumulation of adaptively neutral mutations (i.e., genetic drift).

In sum, the arguments that genetically specified personality differences reflect adaptive alternate strategies have not, to date, led to predictions that have been strongly supported by data. However, although there are many obstacles to the evolution of polymorphisms, there is evidence from both the animal and human world suggesting that it is at least possible that certain personality differences might reflect adaptations to different niches or to varying conditions.

Why We Care about People's Personalities: Personality as a Perceiver-driven Phenomenon

The above discussion concerns whether varying phenotypic trait profiles themselves represent evolved morphs or adaptations. However, another perspective upon personality traits is that they are more important to perceivers than to actors. Humans differ from one another on a large number of conceivable dimensions. But across different cultures and settings, when people go about describing another individual, there are certain dimensions that are generally ignored and other dimensions that are repeatedly invoked. This fact is what has allowed researchers employing the 'lexical hypothesis' to boil down an exhaustive list of many hundreds of everyday personality descriptors into just five underlying trait dimensions (Ashton & Lee, 2005; Goldberg, 1993). Specifically, in taking stock of or describing a person, we are likely to focus on her helpfulness/friendliness, mental stability, sociality/outgoingness, conscientiousness/self-control, and openness to new ideas and experiences. Why do the same five trait dimensions emerge within personality descriptors taken from languages all around the world?

Evolutionary theory suggests a plausible answer to this question – that humans have evolved to attend to those dimensions of personality difference that are adaptively relevant and ignore those that have no consequences for their own fitness (Buss, 1996). Like other social species (e.g., wolves, dolphins, elephants), humans live in groups and interact constantly with other members of their own species. Possibly the most important element of humans' natural environment is other humans, and these other people can serve as both aids and impediments to survival and reproduction (Alexander, 1989; Humphrey, 1976). Negotiating this 'social environment' is one of the most important fitness-relevant tasks facing hominids and apparently led to the evolution of Machiavellian social intelligence (Byrne & Whiten, 1988) and other cognitive adaptations designed to facilitate adept and individually profitable social interaction. Obviously, the tendency to focus on and remember individual people's various behavioral tendencies would be crucial to navigating the social waters.

A simple thought experiment helps illustrate the potential importance of having perceptual mechanisms for imputing Big Five traits. Imagine the situation of trying to predict what will happen if we interact with another person, 'Joe,' in certain ways. Will Joe help me if I am in need, or will he take advantage of me? Will Joe maintain his poise under adversity or let his emotions get the better of him? Can I rely on Joe to do a good job? Does Joe like to take charge or be a team player? Is Joe set in his ways or open to cultural innovation? These questions are relevant whether one is evaluating a person as a possible friend, foe, or mate, and knowledge of individuals' personality characteristics may offer a good tool for predicting answers to these questions (Goldberg, 1981).

From this perspective, it may be that asking why various personality traits evolved confuses the issue by reifying the concept. Perhaps personality traits (such as extraversion) have no concrete existence outside the mind of the perceiver (Mischel, 1968; Shweder, 1975). Or, as discussed above, perhaps trait differences were not subjected to selective pressures, but rather the ability to detect, remember, and process these differences became the fitness-enhancing factor – an ability that seems to be universal in most if not all humans and cultures.

It should be noted that even if traits themselves are adaptively neutral and selective pressures operated only on human perceptual processes, we cannot conclude that traits have no existence outside of the mind of the perceiver. The differences that we have been designed to detect must be real; otherwise, on what basis could correct detection (and thereby prediction) have evolved? In addition, it seems unlikely that individual differences in dispositional personality traits, representing in one sense the 'grist' for natural selection (Nettle, 2006), can have no adaptive relevance at all. Still, we believe that there may be more important aspects of personality to consider besides traits; we turn to these below.

Are Personality Traits enough for an Evolutionary Personality Analysis?

Notably, in their treatments of individual differences in personality, most of the above authors focused on differences in traits, particularly the Big

Five. However, traits are only one aspect of personality and individual differences and possibly not the most useful dimension from the standpoint of trying to predict others' behavior. After all, two individuals could rate an identical profile on the big five scale, but they could still be dramatically different individuals pursuing different goals in life and holding totally dissimilar values. For example, two extraverts could have very different goals, values, and self-images, and how we respond to one versus the other may be very much dependent on whether we share their values, for example, or whether we think they intend to cooperate with us or compete with us. Along these lines, McAdams has argued (1994) that trait psychology is the 'psychology of the stranger': trait information sketches a rough outline of an individual without conveying much of his or her individual essence as a person.

There are also other problems with focusing on personality traits as the key factor that an evolutionary perspective should attend to and try to understand. One is that many personality psychologists do not ascribe causal status to traits, their argument being that invoking a named behavioral regularity ('trait extraversion') in order to explain the observed behavioral regularity (the person is typically talkative and social) is circular. According to this perspective, although traits offer convenient descriptive labels for behavior, they cannot explain behavior. An opposing viewpoint holds that so long as a trait is sufficiently broadly conceived as to be able to predict effects in a number of behavioral domains, then it has just as strong a claim to 'cause' behavior as any other proposed explanation. In any case, invoking a trait as a cause for behavior regularity only pushes the question back a level: What then causes the trait? And how is this upstream cause of the trait to be explained evolutionarily?

Another problem with focusing on personality traits is that big five theorists usually define traits as stable across situations and over time, ignoring or minimizing variations away from the person's modal score (Fleeson, 2001; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997). However, the advantages and disadvantages of various traits are likely to wax and wane across time and place, such that flexibility and variability are the true hallmarks of adaptation. Nettle (2006) used a 'finch beak' metaphor to describe personality, such that different beak-sizes (large versus small) come with trade-offs that enhance adaptation to some environments but reduce adaptation for other environments. However, Sheldon, Sheldon, and Nichols (2007) suggested that even better is to have a beak that can change in size, as circumstances warrant. Behavior (and personality) is probably more like the varying than the invariant finch beak. As a final critique, traits say nothing about personality as a system that integrates all of the disparate psychological elements of a human into a unified and unique whole (Cervone, 2000; Deci & Ryan, 2000). In other words, how do people manage to put it all together, to create a reasonably coherent and successful life?

What Would a Comprehensive Evolutionary Theory of Personality Need to Do?

Consider three levels of individual differences

Thus, one important task for evolutionary personality psychology is to go beyond personality traits in its theorizing about personality processes and individual differences. McAdams (1995, 1996, 2001), a supporter of Kluckhohn and Murray's (1953) conceptualization of the tripartite subject matter of personality, found it helpful to divide individual differences into three basic types (i.e., dispositional traits, characteristic adaptations, and self-narratives). The traits category has already been discussed. The characteristic adaptations category is also a broad one, which includes motivational constructs such as goals, values, and intentionality in general. We saw that this category goes beyond traits in the earlier example of two different extraverts: one with cooperative and one with competitive values. Finally, the self/self-narratives category encompasses people's feelings about their identity: who they are, where they come from and see themselves going, and what their personal 'story' reads like. As noted above, peoples' goals, values, and self-narratives direct their behavior (adaptive or otherwise; Carver & Scheier, 1981) and in turn shape the personalities they project. Because we need to be able to perceive and take into account these internal factors in our dealings with others, humans have apparently evolved a 'theory of mind' mechanism (TOMM; Baron-Cohen, 1995), which helps us to predict the intentions and future behavior of others. Theory of mind is so valuable precisely because it allows humans to move beyond mere knowledge of others' traits, and to mentally 'step inside others' shoes,' simulating their feelings, intentions, and self-images. Thus, a comprehensive evolutionary personality psychology must include motives and self-narratives as features of personality.

Consider a foundational level of personality, beneath individual differences

How can evolutionary theories of personality universals and personality differences be reconciled? In a recent article, McAdams and Pals (2006) endorsed Sheldon's (2004) suggestion that a foundational level be added to McAdams' (1996) proposed three tiers of personality difference. This lowest level of personality would represent evolved universal human nature, existing 'beneath' individual differences. In discussing this core human nature, Sheldon (2004) suggested that a limited set of basic physical needs, psychological needs, socio-cognitive mechanisms, and socio-cultural mechanisms, if functioning properly, orient people in directions appropriate for psychological thriving as well as for survival and reproduction. For example, the ability to perceive traits in others may represent one such universal evolved socio-cognitive mechanism. In particular, Sheldon (2004) discussed basic psychological needs (Deci & Ryan, 2000) as domain-general adaptations of an affective-motivational nature that motivate much positive behavior. Indeed, several other contemporary personality theorists (considered below) have drawn on Darwinian evolutionary theory to argue for the existence and importance of universal psychological needs or motives, arguing that such constructs can explain a great deal about personality differences between individuals. This suggests that a comprehensive evolutionary theory of personality much also consider very broad and cross-domain personality systems.

Consider domain-general motives and mechanisms

As outlined above, the standard evolutionary psychology view of the human mind (e.g., Barkow, Cosmides, & Tooby, 1992; Pinker, 1997) tends to focus on thousands of task-specific mental modules, adaptations possessed by every human. However, MacDonald (1991) took issue with this strong modularity stance, arguing that evidence from personality and other areas of psychology suggests the existence of some domain-general Darwinian psychological adaptations as well as the domain-specific modules often addressed in evolutionary cognitive psychology. In particular, MacDonald proposed the existence of broad affective-motivational systems he called *evolved motive dispositions* (EMDs), advancing an argument similar to those made by Deci and Ryan (2000) and Sheldon (2004) concerning evolved and basic psychological needs. EMDs are domain general psychological mechanisms that tend to motivate people to try to do and get those things important to survival and reproduction. It is not enough, he said, that we possess evolved information-processing systems that enable us to draw cognitive distinctions between elements of our environment. In order to behave adaptively, we must also be motivated to pursue those courses of action that on average tend to benefit our inclusive fitness (even if we don't know, ultimately, why we are pursuing them). Because it is unlikely that evolution could have endowed humans with enough innate decision rules to meet all of the myriad fitness-relevant challenges they would encounter in life, it seems instead to have supplemented our numerous domain-specific cognitive modules with a small number of more flexible, domain-general mechanisms that orient us toward generally wanting to behave in a manner that turns out to be in the best interest of our genes.

Consider how universal needs may lead to phenotypic diversity

A fourth task for evolutionary personality psychology is to understand how the universal leads to the unique; in terms of EMDs, how similar motives within everyone lead to differences between everyone. We think Tooby and Cosmides (1990) were essentially correct in suggesting that many of the observed personality differences between individuals result from a universal evolved psychological system interacting with a unique set of developmental experiences. Indeed, because every individual's developmental experiences are substantively different from everyone else's, this avenue may offer the best means for explaining Kluckhohn and Murray's third aspect of personality, how each individual is unique. Tooby and Cosmides offered no suggestions as to precisely how our species-typical personality system turns different experiences into different, or even unique, personalities. For that, we have to turn to the work of some contemporary personality theorists.

Again, Deci and Ryan (2000), in self-determination theory, proposed universal needs for competence, relatedness and autonomy that evolved as a result of the fitness benefits achieved when people were motivated to want to be able to successfully manipulate their environments; to have friends, allies, and links to a social network/community; and to avoid being controlled by people and social forces around them. Somewhat similarly, Harris (2006) rooted her theory of personality development in the existence of three evolved cognitive-motivational systems: one for socialization (predisposing people to engage in social and cultural learning), one for relationships (focused on keeping track of different individuals and their personality traits, e.g., trustworthiness, instability, etc.), and one for status (motivating people to try to maintain or increase in prestige or power relative to others). As other examples, Hogan (1983) proposed universal motives for social acceptance and for status (i.e., to get along and to get ahead), and Brewer (1991) proposed that human nature includes the sometimes conflicting motives for individual distinctiveness and for group inclusion. All of these contemporary personality theorists ground their theories in Darwinian evolutionary logic, by proposing sometimes conflicting motives that must somehow be balanced within each individual life. In this way, we become like some others, and different from some others.

The concept of basic psychological needs may also help advance understanding about the third component of Kluckhohn and Murray's formulation, concerning how each person is different from *all* other people. Evolutionary psychologists (Cosmides & Tooby, 1994; Pinker, 1997; Tooby & Cosmides, 1989) like to cite Chomsky's (1957, 1980) early linguistic work, where he postulated the existence of a mental organ in the human brain containing an innate grammar designed to facilitate language acquisition (an early and famous use of the adaptive module concept). However, more recent linguistic research by Chomsky and others (Hauser, Chomsky, & Fitch, 2002) has pointed to the crucial role played by the human brain's ability to employ the mathematical concept of recursion. Recursion refers to how a virtually infinite number of outcomes can be created through the use of a few combinatorial rules with a relatively limited number of combinable ingredients. Just as billions of unique genotypes can be created by the combination of a limited number of nucleotides together into DNA base pair sequences, a handful of grammatical rules allow the creation of a near infinity of different linguistic expressions through the combination of a limited number of phonemes.

To complete the analogy, then, perhaps a limited number of innate basic needs or species-typical organismic motives, operating in interaction with each individual's own developmental experiences, are what results in an infinite number of unique personalities. This proposal becomes even more plausible if one or more of the basic proposed needs or motives directly entails distinguishing the self from others (Brewer, 1991; Deci & Ryan, 2000; Hogan, 1998). Indeed, Harris (2006) used exactly such an argument to explain how even identical twins raised together exhibit sometimes surprising dissimilarity. An evolved desire to assert status and be distinct relative to others, possibly as a means of identifying oneself as a person of worth (Crocker & Park, 2003), could motivate a perhaps-infinite number of behaviors and personality styles, each different from all others.

Human Personality versus Animal Personality?

Thus far, we have been dancing around a rather important issue, which is worth finally bringing into focus: Is human personality itself an adaptation, when understood in comparison to the personalities of less cognitively complex animals? To cast personality itself as an adaptation shaped by natural selection necessitates elucidation of the adaptive problems that personality solves and then tracing the trajectory of change from primate precursors to present day human personality. This is a difficult issue, but some preliminary speculations are warranted.

First, it is apparent that other animals (including dogs, cats, pigs, hyenas, chimps, monkeys, etc.) differ reliably on most of the Big Five traits (Gosling, 2001; Gosling & John, 1999; Gosling, Kwan, & John, 2003). Thus, the special nature of human uniqueness cannot be found within the Big Five. To understand animal/human differences, it seems necessary to consider the upper two tiers within McAdams' (1996) hierarchy: goals/motives and selves/self-narratives. In fact, it seems that some primates, and even some birds, appear to pursue goals, meaning that they can maintain an intention in mind and flexibly seek out means to enact the intention (Boesch & Boesch, 1990; Breuer, Ndoundou-Hockemba, & Fishlock, 2005; Hunt, 1996; Hunt & Gray, 2004; McGrew, 1992). Of course, animals cannot maintain goals in mind as long as humans, who are often guided by life-long objectives and purposes, and thus the ability to sustain mental goal-representations within mind may be a crucial difference between humans and other primates. Even more important may be humans' ability to construct and live in an elaborated self-model, consisting of more or less integrated knowledge of one's identity as situated within an evolving life-story. Although there is evidence of rudimentary self-awareness in great apes, dolphins, and elephants (Anderson & Gallup, 1999; Plotnik, de Waal, & Reiss, 2006; Reiss & Marino, 2001), the imaginary world in which human selves live appears to go far beyond animal capacities. Indeed, this may be why the 'theory of mind' mechanism appears to be so important for humans, and why autistic individuals, who lack TOMM, have such difficulty living in the human world (Baron-Cohen, 1995). The ability to construct and live inside of goals and selves, and to read these mental elements within others, may be the most profound adaptations characterizing human beings (Sedikides & Skowronski, 1997). Indeed, the capacity to generate and haunt a mental self may even differentiate *Homo sapiens* from their extinct cousins, the Neanderthals (Arsuaga, 2002).

Conclusion

Evolution by natural selection shaped human personality, just as it created all living systems. The task for evolutionary personality theorists is to make consistent what is known about personality with what is known about human evolution. If this forces the asking of difficult questions about the assumptions of either body of knowledge, then this is for the best. Perhaps evolutionary logic can help advance understanding of personality. At the same time, coming to grips with human personality may help evolutionary psychological theorizing.

In this essay, we have suggested that the search for domain-general adaptations may bear fruit in personality theory because people need to be able to function flexibly in a wide variety of unpredictable environments. For example, a desire for relatedness or belongingness (Baumeister & Leary, 1995) may serve an individual well, no matter what cultural matrix he or she happens to be born into. The key, from this perspective, is to understand both the typical and the unique ways that people might deal with such imperatives. We have also suggested that evolutionary personality theorists need to consider at least three kinds of individual differences: dispositional traits are not enough – characteristic goals/motives and self-concepts/personal narratives must also be considered. Finally, we called for an evolutionary explanation of human uniqueness and suggested that such an explanation may be found, in part, in the operation of universal motives to distinguish the self, to resist unwanted influence, and to make the most of one's own unique set of life circumstances.

Short Biographies

Chuck Nichols is a graduate student in social/personality psychology at the University of Missouri–Columbia. He has interests in motivation, personality, morality, creativity, and autonomy, and has done research on values and political psychology.

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Endnote

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